

## APPENDIX A

### MPW PAVING CAPACITY

Relevant equipment available to MPW ranges in age from 1979 to 2003. Overall, about 84 major pieces of equipment and 18 units of hand-operated equipment are in inventory.

#### A.1 PAVING EQUIPMENT

- **Pavers:** Both a 2003 paver and a 1987 paver are available.
- **Rollers:** A 1986 vibratory roller, a 1988 roller, a 1994 vibratory roller, a 1995 tandem roller, and a 2000 roller are all in service.
- **Oil Distributors:** Two oil distributor trucks, one a 1994 model and the other a 1993 model, are in inventory.

#### A.2 MILLING EQUIPMENT

The equipment available for milling operations are:

- **Milling Machines:** Both a 1990 milling machine and a 1998 milling machine are in the equipment fleet.
- **Road Graders:** Five graders are in the fleet, with model years of 1979, 1980, 1984, 1988, and 1990. (Public Works departments typically keep road graders for many years for snow removal, since municipal governments rarely use the graders in high volume work.)

#### A.3 GENERAL EQUIPMENT

- **Tri-Axle Dump Trucks:** A total of 19 tri-axle dump trucks are in the MPW fleet, ranging in age from 1989 to 2001. Ten of these would routinely be available for a paving project.
- **Skid Loaders:** Two new (2003) skid loaders are in the fleet. (This is the same equipment as referenced in the paving equipment.) Both a 1999 and a 2000 dirt loader are also available.
- **Power Broom:** Both a 1999 power broom and a 2000 power broom are in the fleet.

Hand equipment available to milling crews include one pavement breaker in good condition and five in fair condition along with three jackhammers in poor condition and a vibratory compactor in fair condition. The department has one mason saw in good condition and two in fair condition.

The department also has two shoulder machines and various other trucks and loaders that could substitute for a short time period on a job site.

#### A.4 MPW PAVING CAPACITY INTERVIEW RESULTS

On December 17, 2003, MPW officials met with the consulting team representative to discuss current and future paving capacity of the department. The following information is a summary of that meeting.

Currently, no plans exist to purchase new equipment for the paving operation. A paver was replaced last year.

Aggregates and other materials for temporary repairs are stockpiled, but permanent materials (asphalt concrete) are purchased as needed under on-going contracts. All materials purchased meet state specifications.

MPW does not anticipate performing slurry seal operations in-house. The possibility of crack sealing operations in-house is still under review. New staff would not likely be required for crack sealing.

Given the current staff composition, MPW can place on a given day a full milling crew, a full paving crew, and 26 maintenance crews. The milling and paving crews normally have seven or more members. Truck drivers to support these crews are not included in the numbers. Certain locations may require more staff to support traffic control or other functions. The sizes of maintenance crews vary by project type and location.

The typical MPW paving project is about 500 tons and requires three quarters of a day to complete. If 6 hours (three quarters of a work day) is spent in actual paving, then the typical paving production would be 83 tons per hour, very close to the 80 tons per hour needed to match the unit cost of private sector paving crews.

The annual amount of patching performed is about 66,000 square yards. MPW provides traffic control. Materials are purchased at the batch plants by MPW using contractual unit prices and transported by MPW employees to the job site in MPW trucks.

MPW has established rental rates that include maintenance, overhead, and fuel as well as amortized costs. These rates were used in computing the unit cost for MPW to perform paving and milling operations as discussed previously.

Metro government is self-insured. Since MPW is paying for all materials and labor, it does not need performance or payment bonds.

MPW officials envision the department participating in the group paving program, paving a complete group, as well as continuing the special projects paving program.

MPW Engineering or Street Service staffs provide in-house maintenance and repair projects that require design or detailed instruction.

A major work order must be approved by the department's Work Order Committee.

Two paving machines and two milling machines are listed in the equipment inventory. Both machine types can be used simultaneously, or the older machine of each type can serve as backup. While MPW can field two milling crews or two paving crews simultaneously on a temporary basis by reassigning existing personnel, it cannot support a second crew of either type permanently without hiring new staff.

Public Works has a "Grade Crew" that supports reconstruction and base failure repairs as well as other maintenance functions.

In-house personnel provide quality assurance for in-house paving and repair operations. The testing is provided by an outside vendor who is state-certified.

The typical experience level of a project manager is 30 years, while the typical paving crew foreman has 12 years experience. A typical equipment operator has 20 years experience and formal training.

The typical work shift of the paving crew is 10 hours; under emergency conditions that can be extended to 12 or 14 hours.

The typical backlog of work orders is about 2 weeks.

Work orders are written and issued by a compliance inspector, a supervisor, and staff engineer in the Engineering Division. A supervisor selects the repair technique; the decision can be overridden by the Director. Field inspections are made in advance by a compliance inspector, a foreman, or a supervisor.

MPW has equipment to heat asphalt in advance of pothole repair in winter as well as materials appropriate for both hot patch and cold patch repairs in cold weather conditions. MPW uses cold mix as a material source for asphalt repairs when batch plants close for winter.

The existing equipment fleet can enter alleys safely and efficiently for repairs. However, there is a desire to create a separate maintenance policy for alleys in the downtown area and in other key commercial locations.

Concrete and flowable fill material are sometimes used for utility cut repairs in winter conditions. A supervisor schedules and inspects temporary repairs. Foremen and managers do not frequently need to make policy decisions regarding pavement repair. Work orders are organized by location, type, and priority. Work orders assigned are grouped by the area of the city and by the type of repair. Crews have discretion in the order of the repair in a group of standard work orders.

MPW staff have regular crew meetings in which the projects for the next week or month are discussed in advance. Foremen and managers routinely plan 2 to 3 months in advance. Supervisors place orders for materials based on need. Excess materials at the end of the day are stored for future use.

Supervisors make routine inspections of equipment and tools. Drivers or operators have a checklist to examine prior to the start of the workday, and one crew member checks to be sure all material, tools, safety gear, and signs are on the trucks before leaving the shop. The foreman is responsible for ensuring that MPW, state, and federal safety standards are routinely followed in the field. Crews are familiar with Chapter 6 (Temporary Traffic Control) of the *Manual on Uniform Traffic Control Devices*.

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